

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2003/001623

**A. CLASSIFICATION OF SUBJECT MATTER**

Int. Cl. 7: F25J 1/00, 1/02, 3/02, 3/04, 3/08, 5/00, F25B 25/02, 27/02

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC F25J 1/00, 1/02, 3/02, 3/04, 3/08, 5/00, F25B 25/02, 27/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
DWPI IPC + KEYWORDS (LNG, methane, natural gas, waste, chill, ammonia, energy, heat, absorb, LPG, load)**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2001/88447 A (PHILLIPS PETROLEUM CO.) 22 November 2001 See entire document	1-26
X	WO 2001/46634 A (PHILLIPS PETROLEUM CO.) 28 June 2001 See entire document	1-26
X	WO 2002/086404 A (ELCOR CORPORATION) 31 October 2002 See entire document	1-26

 Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

18 February 2004

Date of mailing of the international search report

25 FEB 2004

Name and mailing address of the ISA/AU

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## INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2357140 A (KVAERNER OIL & GAS A. S.) 13 June 2001 See entire document	1-26
X	WO 2001/49394 A (L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE) 12 July 2001 See entire document	1-26
X	US 6158241 A (ERICKSON) 12 December 2000 See entire document	1-26
X	US 4695303 A (MONTGOMERY IV et al.) 22 September 1987 See entire document	1-24
X	WO 2002/079706 A (ABB LUMMUS GLOBAL INC) 10 October 2002 See entire document	1-14, 24
X	US 4065278 A (NEWTON et al.) 27 December 1977 See entire document	1-12, 24
X	US 2003/0000698 A (LECOMTE) 2 January 2003 See entire document	1-10, 24
X	EP 102087 B (AIR PRODUCTS AND CHEMICALS INC) 30 December 1986 See entire document	1-10, 24
X	GB 1596330 A (CONSTRUCTORS JOHN BROWN LTD et al.) 26 August 1981 See entire document	13-26
X	US 4702819 A (SHARMA et al.) 27 October 1987 See entire document	24-26

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**Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos :  
because they relate to subject matter not required to be searched by this Authority, namely:
  
  
  
  
2.  Claims Nos :  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
  
  
  
3.  Claims Nos :  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

**Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims 1-23 directed towards production of liquefied natural gas.
2. Claims 24-26 directed towards refrigeration during air separation or LPG extraction.

(see reasoning on extra sheet)

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
  
  
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:1-23

**Remark on Protest**

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**Supplemental Box**

(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No: II**

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are different inventions as follows:

1. Claims 1-23 directed towards production of liquefied natural gas. It is considered that "chilling pre-treated gas" comprises a first "special technical feature".
2. Claims 24-26 directed towards refrigeration during air separation or LPG extraction. It is considered that "waste heat is utilised" comprises a second "special technical feature".

Since the abovementioned groups of claims do not share any of the technical features identified, a "technical relationship" between the inventions, as defined in PCT rule 13.2 does not exist. Accordingly the international application does not relate to one invention or to a single inventive concept, a priori.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/AU2003/001623**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member				
WO 0188447	AU 61633/01	BR 0110912	US 6401486			
WO 0146634	AU 21029/01	BR 0016564	EG 22805			
	US 6289692					
WO 02086404	CA 2443905	EP 1387992	NO 20034658			
	US 6526777					
GB 2357140	AU 32505/00	BR 0001769	NO 20002302			
WO 0149394	AU 28608/01	CA 2389546	EP 1250185			
	FR 2803221	US 2003140653				
US 6158241						
US 4695303	AU 75091/87	BR 8703394	DK 345987			
	EP 0252660	JP 63023988	NO 872645			
	PT 85252	ZA 8704348				
WO 02079706	CA 2440142	EP 1373815	NO 20033853			
	US 2002157538					
US 4065278	AU 30280/77	DE 2749673	FR 2409469			
	GB 1545389					
US 2003000698	AU 38249/02	CA 2383283	FR 2824492			
	FR 2826371	NO 20022249				
EP 0102087	AR 231349	AU 18692/83	CA 1200191			
	ES 8507441	JP 59081483	MX 163352			
	NO 833100	US 4445916				
GB 1596330	BE 862384	CA 1083147	DE 2757915			
	FR 2376151	JP 53082800	JP 54076599			
	NL 7714434	SE 7714769	US 4128646			
US 4702819	AU 80061/87	AU 80063/87	AU 80064/87			
	EP 0271658	EP 0272391	EP 0272392			
	IN 171634	IN 171635	IN 172104			
	JP 63161381	JP 63163770	JP 63166402			
	NO 875315	NO 875316	NO 875317			
	SU 1553018	US 4710214	US 4711651			
END OF ANNEX						